

CLAIMS

1. A variable focus lens comprising a chamber (12) filled with a first liquid (13), a drop of a second liquid (11) being disposed at rest on a region of a first surface of an insulating wall of the chamber, the first and second liquids 5 being non miscible, of different optical indexes and of substantially same density, characterized in that:

the first liquid is conductive;

the second liquid is insulating;

in that it comprises:

10 means for applying a voltage between the conductor liquid and an electrode (16; 26; 35-37; 75-79) placed on the second surface of said wall; and

15 centering means for maintaining the centering of the edge of the drop while the voltage is applied and for controlling the shape thereof.

20 2. The variable focus lens according to claim 1, in which the centering means allows a continuous maintaining of the centering of the drop and a continuous control of the shape of the edge of the drop while a varying voltage is applied by said means for applying a voltage.

25 3. The variable focus lens according to claim 2, in which the first surface is substantially flat, the contact region (15) is circular and centered about an axis (0) which is perpendicular to the first surface.

4. The variable focus lens according to claim 3, in which the centering means corresponds to a progressive thickening of the second surface of the wall of the chamber towards said axis, said electrode (26) being applied against said second surface.

30 5. The variable focus lens according to claim 3, in which the centering means corresponds to a radial decrease of the wetting with respect to the first liquid (13), towards the center of said contact region (15) with the second liquid.

6. The variable focus lens according to claim 3, in which the centering means corresponds to a radial gradient of the dielectric constant of said wall of the chamber (53) at the level of said contact region (15) with the second liquid.

5 7. The variable focus lens according to claim 1, in which the first surface is substantially flat, the contact region (15) is circular and centered about an axis (O) perpendicular to the first surface, and wherein the centering means comprises an electrode formed of one or several circular
10 concentric strips (35-37) insulated from each other, centered about said axis, the circular strips being supplied by distinct voltage sources of values decreasing towards said axis.

15 8. The variable focus lens according to claim 1, in which the chamber is cylindrical, the first surface is the internal surface of the chamber, the contact region with the second liquid corresponds to a cylindrical section of the chamber, the centering means is comprised of one or several cylindrical electrodes of same diameter, insulated from each other, placed side by side against the external surface of the
20 chamber at the level of the border of said contact region, the electrodes being supplied by different voltages of values decreasing towards the center of said contact region.

9. The variable focus lens according to claim 1, in which the first surface is substantially flat, the contact region (15) is rectangular and symmetric with respect to an axis (O) perpendicular to the first surface and the centering means is comprised of an electrode formed of one or several rectangular concentric strips insulated from each other, symmetric with respect to said axis (O), the rectangular strips being supplied by distinct voltage sources of decreasing values towards said axis.

25 10. The variable focus lens according to claim 1, in which said wall is comprised of two non parallel planes and in which said region bridges said two planes.